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SECURITY INFORMATION

This document consists of 4 pages
No. 8 of 12 copies, Series A

INTER-COMPANY CORRESPONDENCE

53-436

(INSERT
NAME)

COMPANY CARBIDE AND CARBON CHEMICALS COMPANY

LOCATION Post Office Box P
OAK RIDGE, TENN.

TO Mr. A. P. Huber
LOCATION K-1001

DATE January 6, 1953

ANSWERING LETTER DATE

ATTENTION

COPY TO Messrs. K. W. Bahler

SUBJECT Interim Report on
Plutonium Buildup

Report No.: KP-432

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KP 432 B A



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The plutonium content of Hanford oxide shipped to K-25 has never exceeded 30 ppb, and in most lots has been less than 5 ppb. These concentrations are low enough that they add no appreciable alpha hazard to the uranium in which they occur. However, in the process of fluorinating UF_4 , the plutonium is converted into a fluoride of an extremely fine dust consistency, some of which falls into the ash receiver. A more considerable proportion, however, is carried along by the gas stream.

During August and September of 1952, Hanford depleted oxide was processed which contained up to 15 ppb of plutonium in addition to a maximum of 12,000 ppm of other metallic impurities. The non-volatile plutonium fluorides settled out of the gas stream in some quantity from the tower outlets up to the barrier filter. Metallic impurities dropped out in the same manner and served to dilute plutonium concentrations to some extent. The actual plutonium distribution is shown on Table I. References are made to Figure I of the attached drawing which shows the original piping arrangement. This piping was greatly simplified after completion of impure Hanford oxide in order to reduce plugging difficulties that can result from any level of impurities.

During November and December, 1952, a total of 344 tons (metal) of Hanford material was processed which had been purified at Harshaw Chemical Company down to less than 200 ppm of metallic impurities. In addition, oxide of this same purity was run which had been shipped directly from Hanford. Plutonium content was less than 10 ppb except for approximately 30 tons which had 30 ppb. The points of sampling and results are shown on Figure 2 and Table II.

Carbide and Carbon Chemicals Corporation Operating
Contractor for the U.S. Atomic Energy Commission.

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Classification changed to (level 1 category)

C.G.P.D.-4

By authority of (classification guide)

7/15/94

8/4/94

7/26/85

Technical Information Officer

Oak Ridge K-25 Site

ChemRisk Document No. 2487

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1. Experience during August and September operations resulted in accumulations of Pu. between towers and barrier filter ranging from 2 to 149 ppb (Table I).
2. Results during November and December ranged from 4.9 to 4,000 ppb (Table II).
3. The primary reason for the wide difference between results of Table I and Table II is the dilution effect of metallic impurities.
4. Results in Table I indicate no positive pattern.
5. Results in Table II show somewhat more accumulation at Flange II (Figure 2).
6. Results of tower ash samples all ran less than 72 ppb.
7. Since there are several results approaching and in excess of 1 ppm, the following precautions will continue to be rigorously followed:
 - a. Wearing of army assault masks when performing any work on the tower or any of the system between the tower and the outlet of the barrier filter.
 - b. Use of vacuum hose at any system opening.


J. A. Marshall

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TABLE I

Old Tower System
Fig. 1, Dwg. BK-PK-3315

<u>Point of Sample</u>	<u>PPB of Pu. of Various Samples</u>
B Tower Powder	2
C Tower Powder	2 3
A Tower Dust Trap directly after Tower	2 132
B Tower Dust Trap directly after Tower	---
C Tower Dust Trap directly after Tower	2 23
A Tower Outlet Line	43 52
B Tower Outlet Line	6 18
C Tower Outlet Line	29 67 77
Common Header Section 1	22 150
Converter Ferrule Trap	150
Common Header Section 2	5 24
Common Header Section 3	5
Common Header Section 4	13 19
Primary Cooler	3 6 23 56 149
Barrier Filter	28 28

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TABLE II

Present Tower System
Fig. 2, DWG. BK-PK-3015

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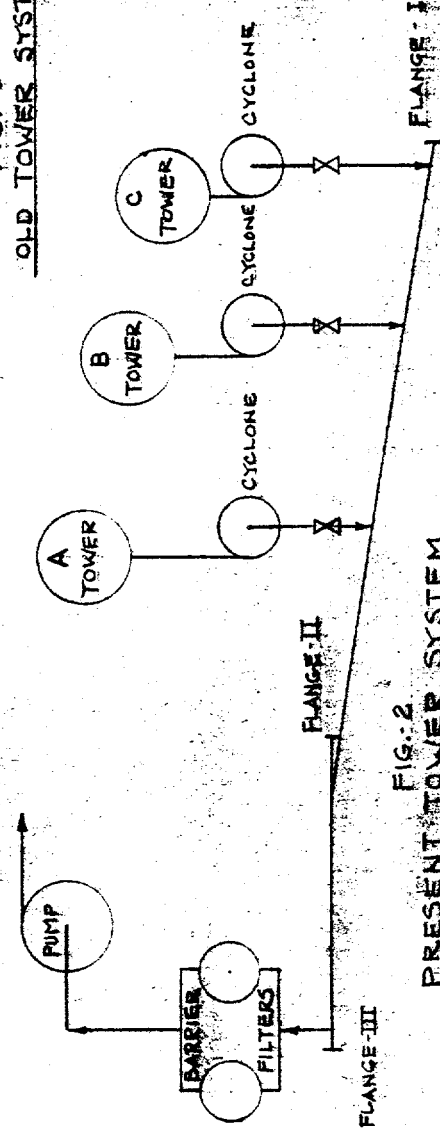
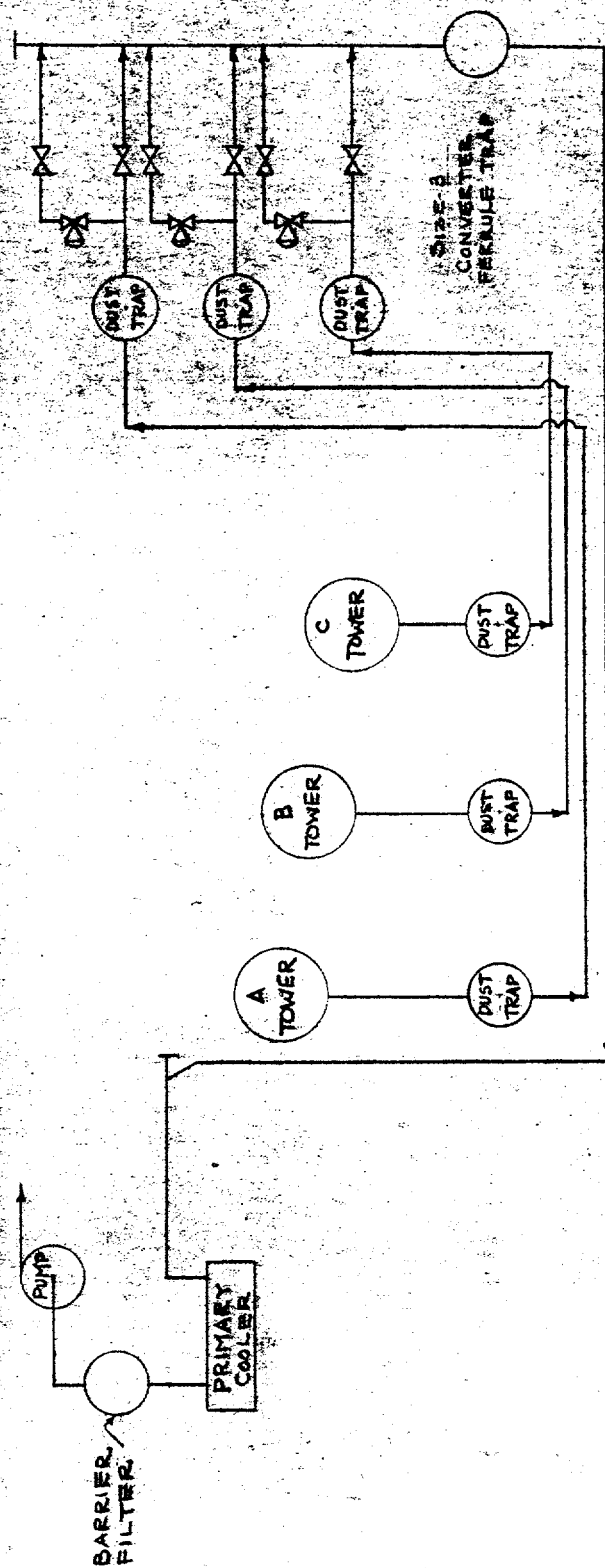
<u>Point of Sample</u>	<u>PPB of Pu.</u>
Asn Receivers under Towers	4.9 9.1 12.7 24 25 71
¹ Common Header taken at Flange I	860
¹ Common Header taken at Flange II	2800
¹ Common Header taken at Flange III	290
² Common Header taken at Flange I	---
² Common Header taken at Flange II	1800
² Common Header taken at Flange III	132
³ Common Header taken at Flange I	121
³ Common Header taken at Flange II	4000
³ Common Header taken at Flange III	400
Barrier Filter	1200
Barrier Filter	750

1. These samples taken at the same time as a set.
2. These samples taken at the same time as a set.
3. These samples taken at the same time as a set.

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PRELIMINARY



DATE	APPD.	DATE	DESCRIPTION	REVISIONS
<p>TOLERANCES $\pm .125"$ ON ALL MECHANICAL DIMENSIONS UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS TO BE HELD TO $\pm .004"$ PRIOR ALL SURFACES TO SYMBOLS SHOWN IN ACCORDANCE WITH EE-102-3</p>				
R.E.S. NO.		C.R. NO.		
B.M. NO.				
ACCT. CHG.		106013		
W.O. NO.				
<p>SCALE $\frac{1}{4} = 1"$</p> <p>DRAWN BY <i>SPM (Original)</i></p> <p>CHECKED BY <i>WJ</i></p> <p>DATE <i>7-2-53</i></p> <p>DEPT.</p> <p>OPER.</p> <p>P.E.D.</p> <p>APPROVAL</p>				
<p>UNION CARBIDE AND CARSON CHEMICAL DIVISION UNION CARBIDE AND CARSON CORPORATION K-28 PLANT</p> <p>FLUORINE TOWERS ARRANGEMENT</p> <p>BLOG NO. K-1131 LOCATION K-27</p> <p>B-KP-K-3815 REV.</p>				